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illumination of *Sirius*. The exposure times given have been those normal for a star of 8.5 magnitude.

Two or three photographs obtained in this way showed a decided maximum in the spectrum at the point at which the companion was kept during the exposure. Still there was no distinct line of separation from the general spectrum due to *Sirius*. A photograph taken on October 18th under exceptionally good conditions of seeing does show such a demarcation, however, there being a narrow spectrum corresponding to the point on the slit at which the companion was held, which is separated by a distinct break from the intense spectrum of *Sirius* near the edge of the star window. It is difficult to avoid the conclusion that this is the spectrum of the companion. There was no ray from *Sirius* near this point of the slit and during the entire exposure the companion was well visible and accurate guiding was easily maintained.

The line spectrum of the companion is identical with that of *Sirius* in all respects so far as can be judged from a close comparison of the spectra, but there appears to be a slight tendency for the continuous spectrum of the companion to fade off more rapidly in the violet region. The suggestion has been made by several astronomers that at least a portion of the light of the companion is due to light reflected from *Sirius*. It is, however, by no means necessary to have recourse to this explanation, since in the case of the companion of  $\alpha_2$  *Eridani*, where there can be no question of reflected light, we know of a similar case of a star of very low intrinsic brightness which has a spectrum of type  $A_0$ .

Direct photographs taken by Dr. VAN MAANEN with and without the use of a yellow color screen agree with the spectrographic results in indicating that the companion of *Sirius* has a color index not appreciably different from that of the principal star.

WALTER S. ADAMS.

#### THE SPECTRUM OF NOVA LACERTÆ (1910).

Two photographs of the spectrum of this Nova were obtained on the nights of September 3d-4th and September 5th-6th with a small slit spectrograph at the primary focus of the

60-inch reflector. The exposure times were about 16 hours in each case, with a slit width of 0.04<sup>mm</sup>.

The photographs show that the intensities of the continuous spectrum and of the bright hydrogen lines remain nearly the same as on a photograph secured in October, 1913. The nebular lines, however, are very much fainter, the chief nebular line being now of nearly the same intensity as  $H\beta$ . It is evident that the spectrum of *Nova Lacertæ*, like that of *Nova Persei* and *Nova Geminorum* No. 2, is developing into the Wolf-Rayet type.

A direct photograph, upon which was superimposed a photograph of the polar sequence, gives a photographic magnitude of 13.5 for the star.

WALTER S. ADAMS,  
FRANCIS G. PEASE.

#### A SEVENTH VARIABLE STAR IN THE HERCULES CLUSTER.

In *Astrophysical Journal*, 40, 179, 1914, Professor BARNARD calls attention to a star in the cluster Messier 13, midway between Scheiner Nos. 231 and 270, which seems to be a variable. The star is evidently Scheiner No. 245 = Ludendorff No. 344. The Mount Wilson plates confirm the suspected variation, though a small change in brightness is recorded.

The observations are as follows:—

Date.	Photographic Magnitude.
1914, August 23d .....	14.8
September 18th .....	15.0
September 19th .....	15.2
October 18th .....	15.1
1915, March 15th .....	14.7

HARLOW SHAPLEY.

#### NOTE ON THE SPECTRUM OF STARS OF HARVARD TYPES N AND R.

The very interesting type of stellar spectrum discovered by Mrs. FLEMING and designated as type R was distinguished by her from that of type N by the relatively great intensity of the violet portion of the continuous spectrum. In a recent comparison of the spectrum of the brightest representative of this type, B. D. — 10°5057, with that of several stars of type N,